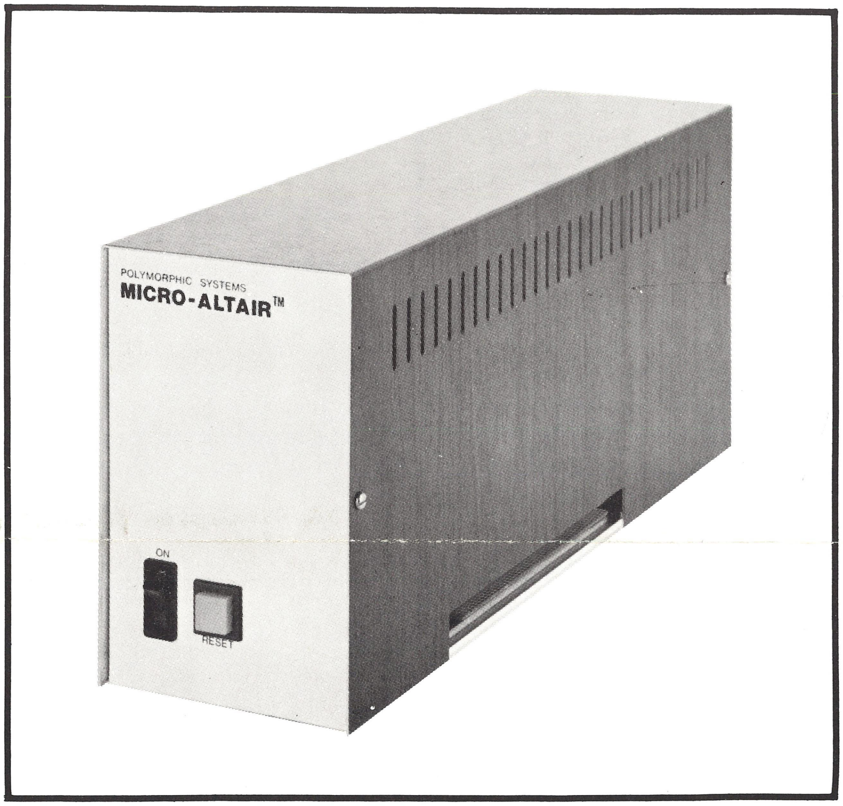


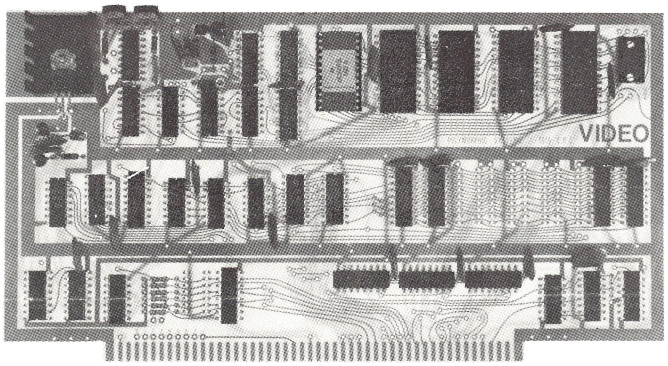
INTRODUCING
THE MICRO-ALTAIR
FROM POLYMORPHIC SYSTEMS

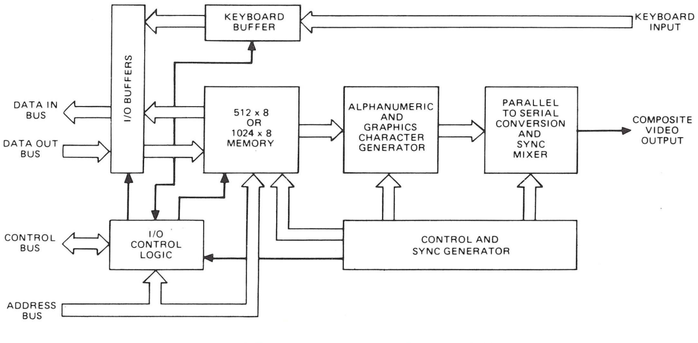
A complete Computer System for the Micro-Computer User.

SANYO
VIDEO
TERMINAL
* ALTAIR 8800 PLUG COMPATIBLE
* 16 lines of 32 or 64 characters
* Upper and lower case (7x9 font)
* Keyboard input port on board
* Graphics capability (48x64 or 128)
POLYMORPHIC SYSTEMS

Video Terminal Interface

Connects to standard TV monitor (or modified received) to display 16 lines of 64 or 32 characters in a 7 x 9 matrix. Character set includes 128 upper and lower case ASCII characters and 64 graphic characters for plotting 48 x 64 (128 with memory option) array. Text and graphics may be mixed on the same screen. 8-bit keyboard input port is provided. Characters are stored in the onboard memory and may be read or written by the computer. Cursor control, text editing and graphics software is included. Fully Altair and IMSAI 8800 compatible.




KEYBOARD BUFFER
KEYBOARD INPUT
I/O BUFFERS
DATA IN BUS
DATA OUT BUS
512 x 8 OR 1024 x 8 MEMORY
ALPHANUMERIC AND GRAPHICS CHARACTER GENERATOR
PARALLEL TO SERIAL CONVERSION AND SYNC MIXER
COMPOSITE VIDEO OUTPUT
CONTROL BUS
I/O CONTROL LOGIC
CONTROL AND SYNC GENERATOR
ADDRESS BUS

VIDEO TERMINAL INTERFACE

POLYMORPHIC SYSTEMS
737 S. Kellogg, Goleta, CA 93017 [805] 967-2351

Specifications

Cabinet, Backplane & Power Supply

Compatibility: Backplane accepts IMSAI/Altair 8800 peripheral and memory cards

Front panel controls: On/off power switch, reset pushbutton, halt acknowledge indicator and power indicator

Power supplies: +8V at 6A, +18V at 0.75A, -18V at 0.25A (unregulated)

Expansion capabilities: 100 edge contacts (gold plated) on backplane, to mate with 100 pin edge connector mounted on next backplane

Number of card positions: 5

Connector type: Dual 50 pin, 0.125'' centers

Cabinet dimensions: 4¼''W x 6¾''H x 17''D

Processor Board

Processor type: 8080A

Number of instructions: 72

CPU registers: Accumulator, 6 general purpose registers, and stack pointer

Addressing modes: Direct, immediate, register, register indirect

Instruction cycle time: 2-18 microsec.

Interrupts: 8 level vectored interrupt

DMA: Daisy-chained bus request logic-allows multiple DMA or processor cards

On board read/write memory: 512 bytes, 500 nS access time

Read only memory: Sockets provided for 3K bytes ROM or EPROM (2704 or 2708 EPROM)

Serial I/O rates*: 50-56K baud synchronous or asynchronous

Serial I/O levels*: Selectable, RS-232C,20mA current loop or audio cassette interface

Cassette interface*: 1200Hz mark, 2400Hz space at 300 baud, 2400Hz mark, 4800Hz space at 600 baud (Kansas City standard interface)

Bus interface: compatible with Altair and MICRO-ALTAIR™ products 16 bit address bus, 8 bit data input bus, 8 bit data output bus and control bus

Bus loading: Outputs drive 30 TTL loads, input are 1 TTL load or less

Bus pinout: Plug compatible with Altair 8800 bus.

Edge contacts: Gold plated, 100 pin (dual 50) on .125'' centers.

Dimensions: 5.3'' x 10.0'' (13.46cm x 25.4cm)

***Serial I/O option**

Video Terminal Interface

Character font: 7 x 9 dot matrix alphanumeric and 6 element graphic characters completely filling character location

Code: ASCII-7 with 8th bit enabling graphic characters set

Character set: 192 — including upper and lower case alphanumeric and 64 graphic characters.

Number of characters: 512 (1024 optional) 32 (64) characters per line with 16 lines

Graphic resolution: 64 (128) horizontal elements by 48 vertical elements

Video output: Composite video, negative sync.

Required bandwidth: 2.5 MHz for 512 characters (standard TV set or monitor)
5.5 MHz for 1024 characters (high-resolution monitor)

Input port: 8-bits, positive or negative strobe.

Bus pinout: Plug compatible with Altair 8800 bus.

Edge contacts: Gold plated, 100 pin (dual 50) on .125'' centers

Dimensions: 5.3'' x 10.0'' (13.46cm x 25.4cm)

Storage temperature: -25 to +85°C.

Operating temperature: 5 to 60°C

Humidity: 0-95% non-condensing

Power requirements: +8 to 10V at 1.2A typ., +15 to 22V at 30mA, -15 to 22V at 20mA

MICRO-ALTAIR—The complete Computer System that requires just a keyboard and TV monitor for use.

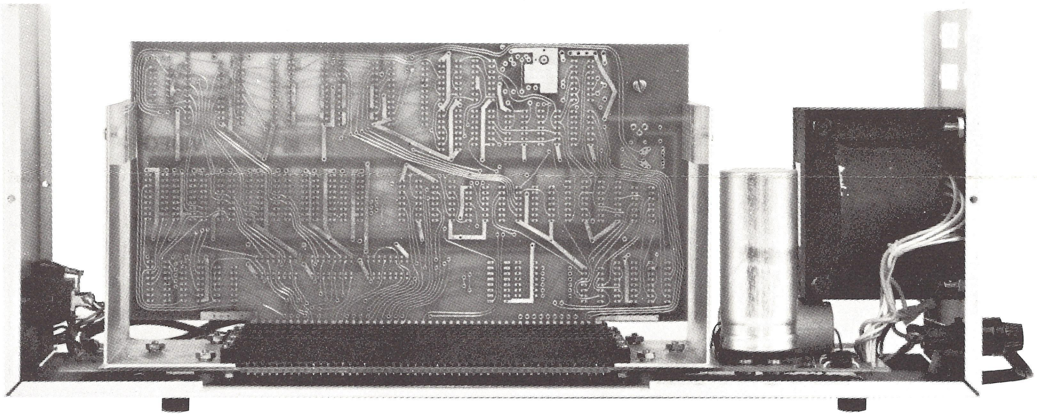
The MICRO-ALTAIR is:

The hardware — video terminal interface board, CPU/ROM/RAM board, backplane, power supply, and cabinet;

The software — video driver, debugger, operating kernel supplied on ROM;

The personal computer system — complete, expandable, no loose ends — a complete and powerful tool;

The SOLUTION BOX from Polymorphic Systems.



Cabinet, Backplane & Power Supply

The MICRO-ALTAIR cabinet is a quarter-rack chassis containing a backplane and a heavy duty power supply. The backplane design is unique in that many backplanes can be plugged together for easy system expansion. Each has a 100 edge contacts and space for 100-pin edge connector to mate with the next backplane assembly. This allows for several cabinets to be plugged together, providing extra space and power for as many cards as desired. Alternatively, a circuit card can be plugged into this expansion slot without opening the cabinet, eliminating the need for an extender card for circuit debugging. Each backplane contains its own power supply (transformer mounted to chassis) rated at 8 volts at 6 amps, +18 volts at 0.75 amp and -18 volts at 0.25 amp. Five boards may be mounted in each backplane assembly.

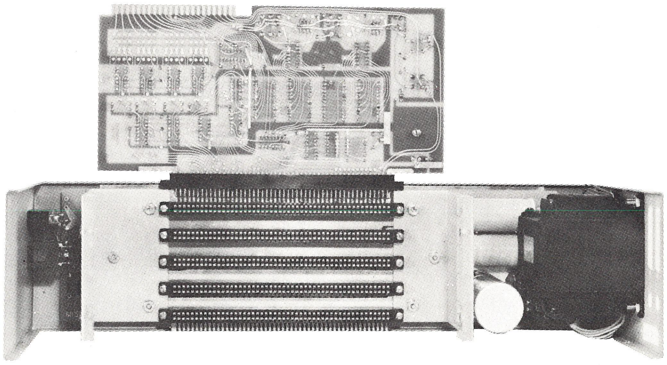
Software

The ROM included on the CPU board contains the resident operating system for the MICRO-ALTAIR computer. Implemented in this ROM are a versatile set of ''front-panel'' functions, debugging aids, and device drivers for keyboard and video display, cassette tape, and ASCII terminals. The front panel functions allow the display and entry of memory data and CPU registers in varied formats, including ASCII, octal and hexadecimal. Programs may be halted, restarted, or breakpoints may be inserted from the keyboard. The device drivers, which are also accessible from user programs, provide for control of the video display, keyboard, ASCII terminal, and the reading and writing of data onto magnetic tape using the optional audio cassette interface. Since keyboard, display, and magnetic tape I/O are controlled using the vectored interrupt system, I/O actions may be concurrent with processing.

Processor Board

The MICRO-ALTAIR is based on the powerful 8080A microprocessor chip, which executes a set of 78 instructions for manipulating 8 and 16 bit data. The processor utilizes 4 addressing modes — direct, register, register indirect and immediate — capable of addressing 64K bytes of memory, and 512 input/output ports. Contained on the board are 512 bytes of read/write memory and space for 3K bytes of read only memory with under 500 ns access time. An option on the processor board is a serial I/O port. Synchronous or asynchronous data may be transmitted at rates up to 56,000 bits per second, configured as an RS-232C or a 20 MA current-loop interface. Space for an optional modem (modulator-demodulator) is provided for an audio cassette interface using the Kansas City standard format.

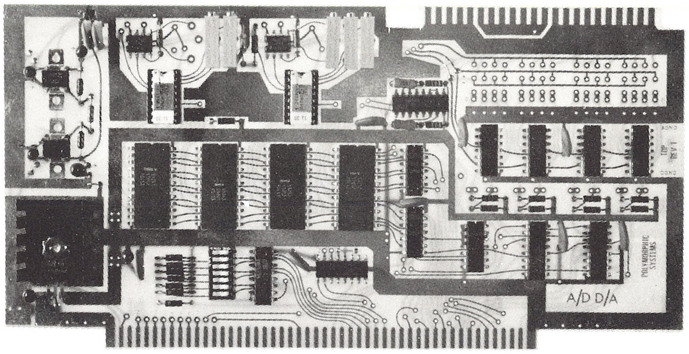
The processor board plugs directly into the MICRO-ALTAIR or IMSAI/Altair 8800 bus. When used with the MICRO-ALTAIR backplane, additional processor boards may be plugged in for microprocessing as the necessary logic is included on the board. Memory and I/O ports added to the backplane are common to all processors while onboard memory and I/O are private to each processor. Each processor board supports up to 8 hardware priority interrupts with more levels available in software. A real-time clock is available, synchronized to the 50 or 60 Hertz line frequency.



POLYMORPHIC SYSTEMS
737 S. Kellogg, Goleta, CA 93017 [805] 967-2351

Altair compatible Analog Interface from Polymorphic Systems

Complete interface for a CRT graphics display or X-Y plotter. Provides 8 channels of software-controlled A/D conversion. 1 or 2 channels of analog output with 10-bit resolution (0-10v or ±5v out), 6-bits of latched digital output, and 8 analog comparators. Software included for A/D conversion by successive approximation and tracking.



Specifications

D/A section — resolution: 10 bits

Linearity: 0.20% max.

Full scale: 10.0V or ±5V

Code: Offset binary

Slew rate: 10V/μS min.

Output inpedance: 75Ω at 20 KHz

Comparators — number of channels: 8

Voltage offset: 10 m V max.

Voltage range: ±10V

A/D section — method: Software controlled (drivers incl. for tracking and successive approx. conversion)

Resolution: 10 bits

Full scale: 0-10V or ±5V

Conversion time: Successive approx. 350μS max., tracking 50μS max. per channel

Storage temperature: -25 to +85°C

Operating temperature: 5-60°C

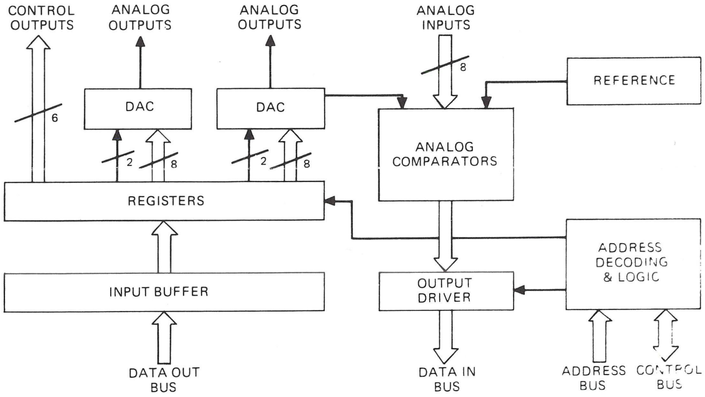
Humidity: 0-95% non-condensing

Power requirements: +7 to 9V at 600mA, +15 to 18V at 80mA, -15 to -18V at 50mA

Bus pinout: Plug compatible with Altair 8800 bus

Edge contacts: Gold plated, 100 pin (dual 50) on .125 centers

Dimensions: 5.0'' x 10.0'' (12.8cm x 25.4cm)



ANALOG INTERFACE

PRICES

MICRO-ALTAIR System

ITEM/DESCRIPTION	KIT	ASSEMBLED	DELIVERY
CP/5 Cabinet, backplane, and power supply	$155.00	$225.00	60 days
DPU/8 Processor board (includes RAM, real time clock and vectored interrupt	195.00	275.00	60 days
VTI/32 Video terminal interface (with 8-bit input port)	160.00	230.00	30 days
ROM/1 Operating system on ROM	125.00	125.00	60 days
2 PC100 100 pin connectors	20.00	20.00	30 days
The complete system purchased separately	$655.00	$875.00	
SPECIAL INTRODUCTORY OFFER [expires April 31, 1976]	**$475.00**		60 days
SYSTEM [after April 31, 1976]	$575.00	$795.00	60 days
SIO/1 Serial I/O option	75.00	105.00	60 days
CAS/1 Cassette option	90.00	125.00	60 days
DPU/SK Socket kit for DPU/8	10.00		60 days

Other Altair compatible products

ITEM/DESCRIPTION	KIT	ASSEMBLED	DELIVERY
VTI/32 Video terminal interface (32 character option)	$160.00	$230.00	30 days
VTI/64 Video terminal interface (64 character option)	185.00	255.00	30 days
VDI/M 64 character option for VDI/32	25.00		30 days
ADA/1 Analog interface (1 channel)	135.00	175.00	30 days
ADA/2 Analog interface (2 channels)	185.00	235.00	30 days
ADA/1B Analog interface (1 channel bipolar)	145.00	190.00	30 days
ADA/2B Analog interface (2 channel bipolar)	195.00	245.00	30 days
VTI/SK Socket kit for both VTI/32 or VTI/64	15.00		30 days
ADA/SK Socket kit for Analog Interface	10.00		30 days

All prices and specifications subject to change without notice. Prices are U.S.A. only. Add 5% shipping, handling and insurance. California residents please add 6% sales tax.

BANKAMERICARD and MASTER CHARGE ACCEPTED

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